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PATENT  
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: WILLIAM L. GROUELL

Patent No.: 5,892,655

Date of Patent: April 6, 1999

Title: Hard Disk Drive Heat Sink

Art Unit:

Examiner:

PRELIMINARY AMENDMENT

Box REISSUE  
Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Preliminary to Reissue examination, please amend the above-identified patent as follows:

IN THE CLAIMS:

Please add the following new claims:

4. (New) A shield for use with a hard disk drive, said hard disk drive having a heat emitting motor, comprising:

a plate having two spaced apart sides defining a thermal conductive region therebetween;

said plate comprising a plurality of louvers adapted to dissipate heat from said plate, each one of said plurality of louvers comprising a fin slanting upwardly from said plate, each said fin having three primary edges comprising a longitudinal edge having ends spaced inward from said sides and two side edges at said ends substantially perpendicular to said longitudinal edge, said fin having a fourth edge integral with said plate and spaced apart from and substantially parallel to said longitudinal edge, said fourth side interconnecting said side edges, each said fin being connected to said plate and located between said sides.

5. (New) The shield according to Claim 4, wherein said plate further includes a depression located to contact said motor when said plate is attached to said hard disk drive.

6. (New) The shield according to Claim 4, wherein said plate further includes outward-upward slanted end edges.

7. (New) The shield according to Claim 4, wherein said plate further comprises a substantially rectangular shape.

8. (New) The shield according to Claim 4, wherein said fin further comprises a substantially rectangular shape.

9. (New) A shield for use with a hard disk drive having a heat emitting motor, comprising:

a plate comprising a substantially planar surface disposed in a first plane;

and

a plurality of louvers provided in said plate, each of said plurality of louvers comprising a substantially planar surface disposed in a respective second plane that intersects said first plane at a corresponding angle, each of said plurality of louvers further comprising a plurality of side edges including an integral side edge connected to said plate.

10. (New) The shield according to Claim 9, wherein said plate further comprises a substantially rectangular shape having two spaced apart sides defining a thermal conductive region therebetween.

11. (New) The shield according to Claim 10, wherein said plurality of side edges further includes a distal side edge opposite said integral side edge having ends spaced inward from said two spaced apart sides, said distal side edge being substantially parallel to said integral side edge.

12. (New) The shield according to Claim 11, wherein said plurality of side edges further includes two end side edges disposed substantially perpendicular to said distal side edge.

13. (New) The shield according to Claim 9, wherein said respective second planes of said plurality of louvers are substantially parallel to one another.

14. (New) The shield according to Claim 9, further comprising a second plurality of louvers provided in said plate, each of said second plurality of louvers comprising a substantially planar surface disposed in a respective third plane that intersects said first plane at a corresponding angle, each of said second plurality of louvers further comprising a plurality of side edges including an integral side edge connected to said plate.

15. (New) The shield according to Claim 9, wherein said plate further includes a depression oriented to contact said motor when said plate is attached to said hard disk drive.

16. (New) The shield according to Claim 9, wherein said plate further includes two end louvers, each said end louver comprising a substantial planar surface that intersects said first plane at a corresponding angle.

17. (New) A computer storage system comprising:
- a hard disk drive having a heat emitting motor; and
  - a shield attached to said hard disk drive, said shield comprising:
    - a plate comprising a substantially planar surface disposed in a first plane; and
    - a plurality of louvers provided in said plate, each of said plurality of louvers comprising a substantially planar surface disposed in a respective second plane that intersects said first plane at a corresponding angle, each of said plurality of louvers further comprising a plurality of side edges including an integral side edge connected to said plate.

19. (New) The storage system according to Claim 18, wherein said plurality of side edges further includes two end side edges disposed substantially perpendicular to said distal side edge.

21. (New) The storage system according to Claim 17, wherein said plate further comprises a substantially rectangular shape.

LA2:555343.1

### STATUS OF CLAIMS

Claims 1-22 are pending in this Reissue application.

### SUPPORT IN DISCLOSURE FOR CLAIMS

Support for Claims 4, 7-8, and 9-14 can be found in the disclosure at col. 2, line 23, col. 2, lines 30-36, and Figs. 1-2.

Support for Claims 5 and 15, including the respective base claims, can be found in the disclosure at col. 2, line 23, col. 2, lines 25-27, col. 2, lines 30-36, and Figs 1-2.

Support for Claims 6 and 16, including the respective base claims, can be found in the disclosure at col. 2, line 23, col. 2, lines 30-36, col. 2, line 41, and Figs. 1-2.

Support for Claims 17-19 and 21-22 can be found in the disclosure at col. 2, lines 14-17, col. 2, line 23, col. 2, lines 30-36, and Figs. 1-2.

Support for Claim 20, including the base claim, can be found in the disclosure at col. 2, lines 14-17, col. 2, line 23, col. 2, lines 25-27, col. 2, lines 30-36, and Figs. 1-2.

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REMARKS

The Applicant has amended the above identified patent by adding Claims 4-22. Reissue examination on the merits of Claims 1-22 is respectfully requested.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

Respectfully submitted,



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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS:**

The following new claims have been added as follows:

4. (New) A shield for use with a hard disk drive, said hard disk drive having a heat emitting motor, comprising:

a plate having two spaced apart sides defining a thermal conductive region therebetween;

said plate comprising a plurality of louvers adapted to dissipate heat from said plate, each one of said plurality of louvers comprising a fin slanting upwardly from said plate, each said fin having three primary edges comprising a longitudinal edge having ends spaced inward from said sides and two side edges at said ends substantially perpendicular to said longitudinal edge, said fin having a fourth edge integral with said plate and spaced apart from and substantially parallel to said longitudinal edge, said fourth side interconnecting said side edges, each said fin being connected to said plate and located between said sides.

5. (New) The shield according to Claim 4, wherein said plate further includes a depression located to contact said motor when said plate is attached to said hard disk drive.

6. (New) The shield according to Claim 4, wherein said plate further includes outward-upward slanted end edges.

7. (New) The shield according to Claim 4, wherein said plate further comprises a substantially rectangular shape.

8. (New) The shield according to Claim 4, wherein said fin further comprises a substantially rectangular shape.

9. (New) A shield for use with a hard disk drive having a heat emitting motor, comprising:

a plate comprising a substantially planar surface disposed in a first plane;

and

a plurality of louvers provided in said plate, each of said plurality of louvers comprising a substantially planar surface disposed in a respective second plane that intersects said first plane at a corresponding angle, each of said plurality of louvers further comprising a plurality of side edges including an integral side edge connected to said plate.

10. (New) The shield according to Claim 9, wherein said plate further comprises a substantially rectangular shape having two spaced apart sides defining a thermal conductive region therebetween.

11. (New) The shield according to Claim 10, wherein said plurality of side edges further includes a distal side edge opposite said integral side edge having ends spaced inward from said two spaced apart sides, said distal side edge being substantially parallel to said integral side edge.

12. (New) The shield according to Claim 11, wherein said plurality of side edges further includes two end side edges disposed substantially perpendicular to said distal side edge.

13. (New) The shield according to Claim 9, wherein said respective second planes of said plurality of louvers are substantially parallel to one another.

14. (New) The shield according to Claim 9, further comprising a second plurality of louvers provided in said plate, each of said second plurality of louvers comprising a substantially planar surface disposed in a respective third plane that intersects said first plane at a corresponding angle, each of said second plurality of louvers further comprising a plurality of side edges including an integral side edge connected to said plate.

15. (New) The shield according to Claim 9, wherein said plate further includes a depression oriented to contact said motor when said plate is attached to said hard disk drive.

16. (New) The shield according to Claim 9, wherein said plate further includes two end louvers, each said end louver comprising a substantial planar surface that intersects said first plane at a corresponding angle.

17. (New) A computer storage system comprising:  
a hard disk drive having a heat emitting motor; and  
a shield attached to said hard disk drive, said shield comprising:  
a plate comprising a substantially planar surface disposed in a first plane; and  
a plurality of louvers provided in said plate, each of said plurality of louvers comprising a substantially planar surface disposed in a respective second plane that intersects said first plane at a corresponding angle, each of said plurality of louvers further comprising a plurality of side edges including an integral side edge connected to said plate.

18. (New) The storage system according to Claim 17, wherein said plurality of side edges further includes a distal side edge opposite said integral side edge, said distal side edge being substantially parallel to said integral side edge.

19. (New) The storage system according to Claim 18, wherein said plurality of side edges further includes two end side edges disposed substantially perpendicular to said distal side edge.

20. (New) The storage system according to Claim 17, wherein said plate further includes a depression oriented to contact said heat emitting motor when said plate is attached to said hard disk drive.

21. (New) The storage system according to Claim 17, wherein said plate further comprises a substantially rectangular shape.

22. (New) The storage system according to Claim 21, wherein said hard disk drive further comprises a substantially rectangular shape.